

# MARINE REVIEW.

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No. 3.

## The Schlesinger Failure

Among the iron ore sales agents the second failure of Ferdinand Schlesinger, a few days ago, was not a surprise, and from all that can be learned it is probable that the action of the Chicago & North Western Railway Company in enforcing its claim for freight against the Buffalo Mining Company will result in a readjustment of the affairs of all the Schlesinger properties excepting the Chapin, in which other and more powerful interests have ruled since the trouble of two years ago, when the Vanderbilts joined M. A. Hanna & Co. of Cleveland in clearing up the difficulties connected with that mine. If the present paralysis in the iron trade removes Mr. Schlesinger from the active position he has held with several mining companies in the Lake Superior regions, he will not with his associates have sustained the loss of millions that might be inferred from the numerous sensational stories that have been printed about the wealth and great operations of the Schlesinger "syndicate." The fact is that when Ferdinand Schlesinger and his two brothers began the purchase of Michigan mines they did not have between them more than about \$400,000, and there was no syndicate of wealthy foreigners then nor has there been since any such syndicate back of their operations. They managed with this capital, however, to promote some monstrous enterprises, first by the purchase of the big Chapin mine, then the building of a railway with docks at Escanaba and latterly the construction, through the assistance of M. A. Hanna & Co. of Cleveland, of a fleet of six steel steamers and ore receiving docks at Ashtabula. As these undertakings were all controlled by separate companies, they have since undergone changes of management that have removed them from any connection with the Buffalo and other mines under the direct control of the Schlesingers. The railway and docks at Escanaba are, as is well known, now owned by the North Western company, or the Vanderbilts, who control that company, and the Chapin Mining Company as well as the vessels built under contract with the Chapin company, can only be affected to the extent of the Schlesinger interest, which has not been important since the reorganization of two years ago.

## Strange Features of the Freight Market.

In all cases where managers of mining companies have been able to secure ready money enough to pay freight charges they have moved ore, during the past ten days, more freely than anything in the way of direct assurances as to the future of the ore market will warrant, but the rates of freight have been so low that there is no possible chance of loss on account of the cost of transportation. The movement from Marquette, where the rail rate from the mine combined with the lake rate has been in some instances lower than 95 cents, has been especially active. This action of the ore shippers, together with some demand for vessels to take grain out of Chicago, has furnished cargoes enough to induce owners to keep their vessels in commission, in pursuance of the hope entertained for several weeks past, that confidence in general business circles will soon be sufficiently restored to bring about improvement. There is, however, a discouraging feature to the vessel owner in this movement of ore, aside from the low freight rates attending it. The ore that is now coming down is, on account of the general suspension of mining operations, largely drawn from stock piles that are not usually cleaned up until late in the season, and the shipment of it at this time is altogether favorable to the mine owner, who can get along with just so much

less tonnage later on in event of higher freight rates. The present shipments from stock piles will not add materially to the season's business, which must in any event fall far short of previous years, as a most active resumption of mining operations could not result in regaining the loss already sustained through idleness in the mines. There is grain enough in the west to give employment to the surplus tonnage if the export demand so long anticipated should materialize, and the shortage of soft coal in the northwest is another factor that would lend improvement to freights if the condition of finances should change so as to permit of the coal producers increasing their output, but these are uncertain matters that afford little relief in considering the probability of a large amount of tonnage being forced to lay up during the coming month, when stock piles at the ore mines are pretty well exhausted. The best hopes of the vessel owners must, accordingly, center in grain shipments, which at present show some signs of life.

The only encouraging feature in the iron market of late, which does not, however, indicate an increase in the consumption of ore, is a reduction of the number of furnaces in blast. The make of pig iron has been reduced on a weekly basis that is equivalent to about 1,000,000 tons a year.

## A Coal Trade Relic.

Among old papers in the office of one of the lake coal shipping firms of Cleveland, there was found recently a circular letter, dated Youngstown, O., Feb. 1, 1860, and issued by David Tod, afterwards one of the war governors of Ohio, and a man of renown in the history of the state. In the circular Mr. Tod announced that, as owner of the Brier Hill and Mineral Ridge coal mines, he was prepared to deliver on board vessels at Cleveland any quantity of coal from either of the mines named. For the information of gas companies, from whom he evidently expected considerable patronage, he had obtained, through the Manhattan Gas Company of New York, analyses of the coals, which were printed in connection with the circular. The analyses were compared with similar data regarding the coals of Newcastle (Eng.) and the Pittsburg district of Pennsylvania. It was evidently the custom in those days to give references in such communications, as Mr. Tod referred prospective customers to Hon. Millard Fillmore of Buffalo, Hon. Frank Granger of Rochester, Erastus Corning of Albany and Charles Roome of New York. The Brier Hill coal, a Mahoning valley product, is of course well known as yet to the trade.

## Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store at the principal points of accumulation on the lakes on July 15, 1893:

	Wheat, bu.	Corn, bu.
Chicago .....	19,383,000	1,748,000
Duluth .....	5,016,000	.....
Milwaukee .....	1,202,000	6,000
Detroit .....	734,000	1,000
Toledo .....	1,554,000	187,000
Buffalo .....	2,181,000	495,000
Total .....	30,070,000	2,437,000

At the points named there is a net decrease for the week of 1,422 bushels of wheat and a net decrease of 620,000 bushels of corn.



### Chief Naval Constructor, U. S. N.

Herewith is presented the portrait of Phillip Hichborn, successor to Commodore T. D. Wilson, who retires from the position



of chief naval constructor on account of failing health. Mr. Hichborn is very generally known through his report on European dock yards. He was born in Charlestown, Mass., in 1839, and at the age of seventeen entered the Boston navy yard, from which place the secretary of the navy ordered him to take a course of theoretical training. Going to California he became master shipwright of the Mare island yard. In 1875 he passed examinations that gave him a commission of naval constructor. In 1881 he was

made a member of the naval advisory board, where he had much to do with matters affecting the designing and construction of the new navy. His advocacy of sheathing ships is receiving much consideration in the navy. The portrait was furnished by the Army and Navy Journal, New York.

### Kites for Life Saving Purposes.

Professor J. Woodbridge Davis of the Woodbridge School, No. 645 Madison avenue, New York city, is the inventor of a system which proposes the use of kites as a means of connecting a stranded vessel with the shore for life saving purposes. He has been furnishing the Marine Journal of New York with reports of experiments.

The philosophy of the idea is very clear and ready of comprehension. A vessel that is wrecked is almost always carried ashore, or upon reefs or shoals, by the force of the wind. The wind being steadily upon the shore, it is a very difficult matter to get a line in the teeth of a gale from the shore to the vessel by any means at the command of the life savers, the vessel itself being such a small mark and often very far out from the beach. But the gale itself, by means of kites, affords the ready opportunity of getting communication from the vessel to the shore, and it is very gratifying to find that experiments which have been conducted from time to time with the idea of perfecting a system in this line, as noted occasionally in the past, have at length proved successful in the greatest degree. The fact has been established that, with the wind blowing at the rate of twenty-five miles an hour or more, one or two kites will prove amply sufficient to convey a heavy hawser from a vessel to the shore over any space likely to intervene. The same plan may also be used to send a line from one ship to another at sea, and the whole thing can be accomplished in a very short time.

In the latest experiments, which took place a few days ago, the test attempted was the practicability of taking a serviceable life line from a vessel a mile and a half off shore, and how well it was attained is shown in the following extract from a letter written by Edward Fogarty, keeper of the Brenton reef light-ship, off Newport, R. I., who made the tests. Keeper Fogarty writes:

"I sent out a 5-inch hawser, 200 fathoms long, with one kite, at 9 a. m., the wind blowing about twenty-five miles an hour toward shore. I had marked the hawser at every fifty fathoms. The kite took the hawser from the deck itself, and this is the time: First fifty fathoms, two and one-half minutes; second fifty fathoms three minutes; third fifty fathoms, three minutes; fourth fifty fathoms, four minutes. With a little stronger breeze the kite will lift the hawser out of the water and,

instead of taking out two hundred fathoms, there would be no trouble in sending out one thousand fathoms."

The method of flying the kite from shipboard is to raise it by topline to a yardarm or flagstaff until it fills and then cut the topline. The inventor has designed for a vessel's equipment a kite chest containing a dozen kites of four different sets of dimensions, for winds ranging from fifteen miles per hour upward. Each kite is plainly marked with the number of miles of wind it can stand and simple directions for its use. The end of the hawser to be sent ashore is made fast to a light buoy, and the kite, with sufficient towing line to give it good altitude, is attached to the buoy. It has been found that in a strong breeze, without brakes on the hawser being paid out, a seven-foot kite will lift the buoy fifty or sixty feet out of the water, and whenever the buoy strikes wreckage or other obstruction, the kite will carry it clear over. A kite with a float conveying a message has been sent ashore a distance of four hundred miles in a single day. For a long fly with a heavy line, a second kite has been attached successfully half the distance out. Prof. Davis will supply full information regarding experiments upon application to him at the above address.

### Will the Campania Fulfill Expectations?

Major Walter Webb, Mr. Depew's associate in the management of the Central system, has just returned from Europe, and he confirms the stories that have prevailed lately, which assert that considerable doubt exists whether the Campania is, after all, going to fulfill the very high expectations which her early performances upon the sea and the calculations of her builders created. That she is a wonderfully fast steamship is beyond all question, and that she is likely, under favorable conditions, very greatly to reduce the record is also the belief of her officers and builders. But that which has excited comment about her is the experience she has recently had, which leads to the suggestion that possibly the limit has been reached, if not passed, in the construction of ocean steamships on the model employed in building the Campania.

If the ocean were always as still as a river, there is no doubt that the Campania would justify the expectations of her builders, but the question which has been suggested is whether a steamship of her model, having great length and carrying amidships immense weight in the shape of boilers and engines, and which is subjected to the enormous strain entailed by the development of very high speed, will not develop structural weakness in time of severe weather at sea.

Ex-Senator Pierce, lately minister to Portugal, who returned by the Campania, when she experienced some comparatively rough weather, reports that she strained in a manner perceptible to the passengers, and most unpleasantly suggestive of serious consequence in case she should encounter a hurricane. Major Webb says that there is much comment of this kind upon the other side, all of it tending to the belief that perhaps the finest development of ocean steamships and the limit of such development along these models was reached when the Paris and New York and the Majestic and Teutonic were built.

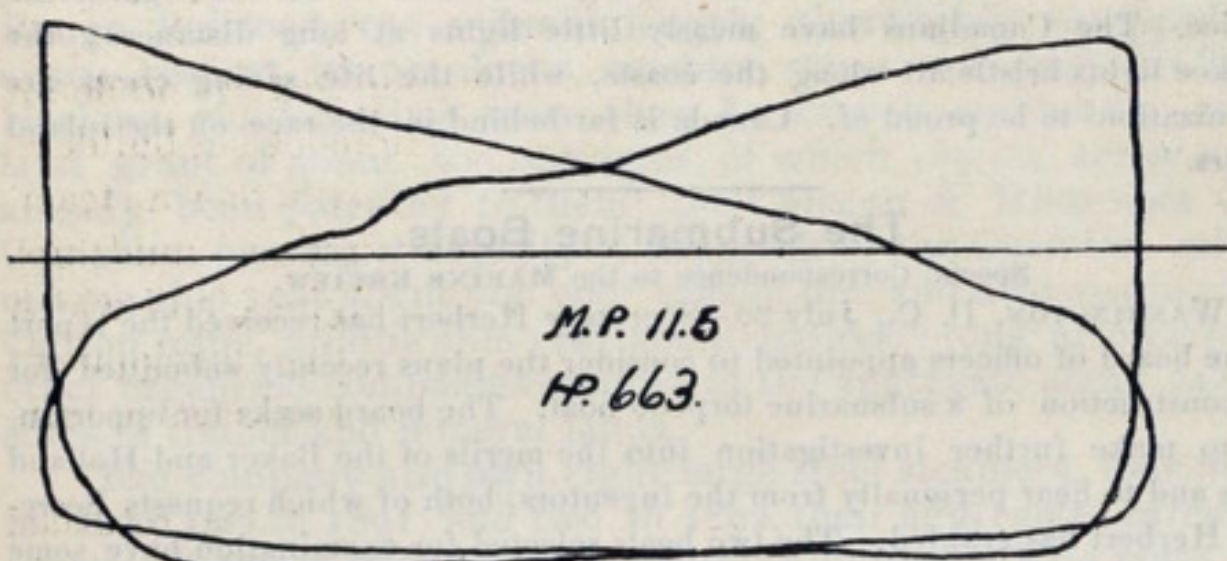
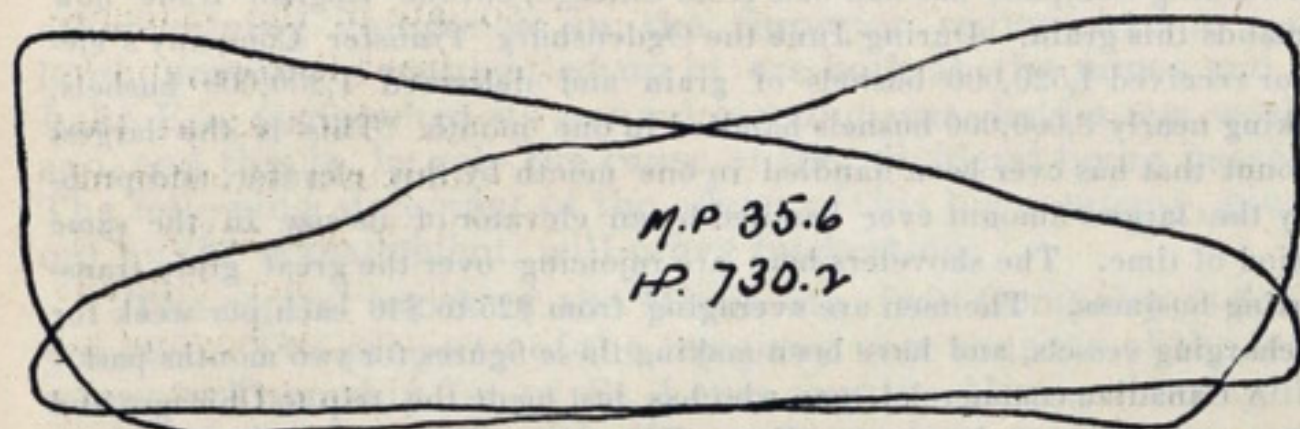
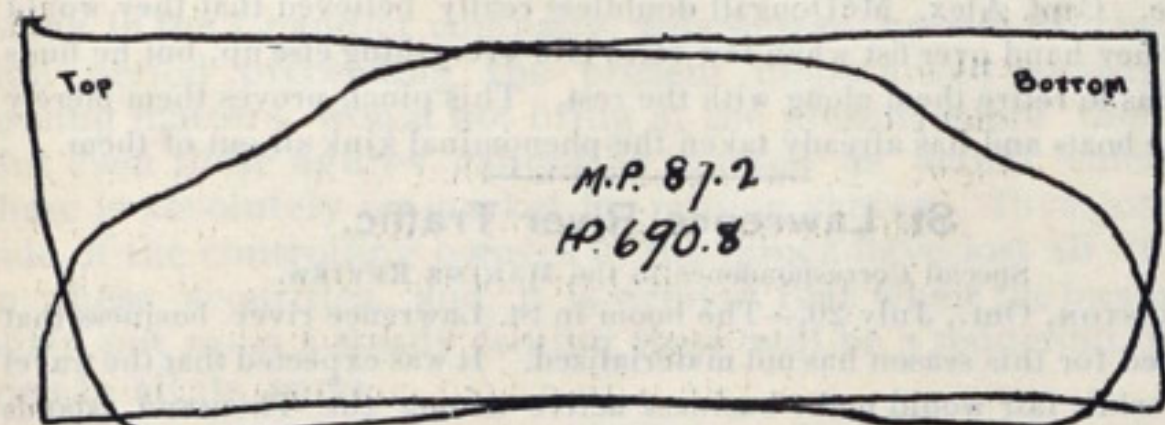
There is a great interest upon the other side in the steamships which are to be built by the Cramps for the American Line, and Major Webb says that the belief prevails over there that these vessels will not follow the English model in all respects, but will reveal certain improvements in construction designed to overcome those very weaknesses which have been suggested but have not yet been proven to exist in the Campania.—"Holland" in Philadelphia Press.

The Sheriff's Manufacturing Company of Milwaukee sends out a unique advertisement in the form of a miniature propeller wheel that makes a neat watch charm. They are generous about them. We sent for one and got half a dozen.



## Cards from Engines of the Merida.

Cards printed herewith are from the engines of the steamship Merida, a two-page illustration of which was published in Vol. VII No. 8 of the REVIEW. The Merida, which was built by F. W. Wheeler & Co. of West Bay City, Mich., for D. C. Whitney and others of Detroit, was engined by the Frontier Iron Works of Detroit. The cards were taken on the steamer's maiden trip, and for new engines they show a remarkable performance. The Merida gives promise of being a "flyer" and we hope to be able soon to chronicle some fast time for her. James Norton is chief engineer of this boat.



Lake Huron, June 29, 1900; ship loaded.  
Engines, 23, 37 and 62 x 44 inches.  
Steam, 167 pounds.  
Vacuum, 24 inches.  
Revolutions, 86.  
Total I. H. P., 2,084.  
Referred M. E. P., 36.1.

## Marine Engine Design—Cylinders.\*

(Continued from Vol. VII, No. 19.)

It is by no means an unusual idea among those unacquainted with the actual process, that problems of design are settled by simple substitution in some mysterious formula, the result so found being forthwith adopted without further question. Nothing, of course, can be farther from the truth. If dimensions depended solely on the strength necessary, and if it were always possible to know what stress would come on a given piece, and how strong the material of such piece were, then such simplified methods might be followed. Unfortunately, none of these conditions are fulfilled, and in addition, a number of considerations other than strength must be taken into account. Such are stiffness, corrosion and wear, frictional work, refitting, cost and ease of manufacture, and included withal, must be a large factor of safety to guard against the unknown and the unknowable. This factor is commonly called one of safety, although with equal propriety it might be called a factor of ignorance; or perhaps, rather it might be considered as a product of two factors, one of

safety proper, and the other of ignorance. It must not be supposed, however, that this ignorance can easily be avoided, or that it is an ignorance of which we need feel ashamed. It exists largely in the inherent nature of things, and only in small measure and by patient search, can we gradually decrease its amount.

Nowhere, perhaps, are these remarks better illustrated than in the case of cylinders for marine engines. They must not only be strong, but stiff as well, and perhaps have a margin in addition, to provide for future reboring. The actual condition of stress is due to internal pressure and irregular stresses arising from vibration and unequal expansion and contraction, must always contain a large element of the unknown. The ultimate strength of the material itself must also be uncertain, at least in a very considerable degree. Under these circumstances, nothing but the integration of extended experience with these various factors can be of any practical value in the treatment of such problems. At the same time, it is highly desirable to put this experience into such shape that its results may be applied to proposed cases. This is done by means of various empirical formulae which have been proposed for the thickness of cylinder wall. This question depends, moreover, somewhat on the question as to whether or not liners are to be fitted. If steam jackets are used liners, of course, are fitted, but in some cases, especially in the high pressure cylinder, liners are fitted even when the space is not used as a steam jacket. The difference in thickness does not so much depend on the element of strength, as on the desirability of sufficient metal to admit of reboring. With vertical engines, this operation is not nearly as common as with horizontal, and there is no doubt but that the addition of metal to admit of such refitting is a matter, the utility of which may be well called in question. Many engineers, however, still prefer to have such surplus, and if the cylinders are unprovided with liners, the extra thickness must necessarily go into the barrels, while if liners are fitted, it will naturally be put into the latter. Without discussing in detail the various formulae which have been proposed for this purpose we will state at once that the one which seem on the whole most satisfactory is of the form

$$t = CD \sqrt{a}$$

In this formula,  $t$  and  $D$  are thickness and diameter in inches, while  $C$  and  $a$  are constants. The value of these constants will depend somewhat on whether the formula is to be applied to the cylinders of large marine engines or small light yacht engines. Taking first the former and considering that liners are not to be fitted, the value of  $C$  may be taken as .01 and  $a$  as 1 inch. We have for such case therefore:

$$t = .01 D + 1''$$

If liners are fitted,  $C$  may be taken the same as before, and  $a$  may be taken as .8 inch. These values will give reliable results for cylinders of 20 inches diameter and upward, the material being the best cast iron.

For small cylinders,  $C$  may be taken as .02 and  $a$  as .6 inch without liners and .4 inch with. For such cases we should have, therefore

$$t = .02 D + .6'' \text{ and}$$

$$t = .02 D + .4''$$

In the case of the engine used for illustration in these papers, the diameters are 20½ inches, 33½ inches and 54 inches. The thickness of cylinder barrel without liners would then result as follows:—

$$H. P. t = 1''.205$$

$$I. P. t = 1''.335$$

$$L. P. t = 1''.54$$

As the nearest shop dimension we may take 1½ inches 1¾ inches and 1½ inches. It may be observed that it is not uncommon to find the intermediate and low pressure barrels of the same thickness, or occasionally all three. In such case, the value taken would equal that required for the largest cylinder of those whose thickness was taken the same. If liners are to be fitted we should find:

$$H. P. t = 1''.005$$

$$I. P. t = 1''.135$$

$$L. P. t = 1''.34$$

Or as shop dimensions we may take 1 inch 1½ inches and 1¾ inches.

Liners may be made from .7 to .8 the thickness of the barrel. It is not uncommon, however, to make them all of the same thickness, in which case about .8 of the I. P. cylinder wall will give, for usual sizes a fair value. In the present case, this would indicate a thickness of .9 inch, or say ¾ to 1 inch.

The flanges of a cylinder may have a thickness of about 1.25  $t$ , and the metal of the valve chest and passages about .75  $t$ . For the cylinder head and covers, either a single or double shell is used with radial strengthening ribs. Nothing but experience can indicate their proper dimensions. In thickness, these vary but little with the diameter, extra strength for large diameters being better obtained by deepening the ribs than by thickening the shells. The thickness of the shells and ribs varies but little from 1 inch or slightly less for small cylinders. For large cylinders, or where the ends are to be jacketed, the double shell is fitted. On small unjacketed cylinders, the single shell will answer, though between the terms large and small no sharp line of demarcation exists. The ribs are usually six or eight in number, radiating from a central ring or boss outward. Their depth increases from the center, outward and as a maximum may be taken as about one-tenth the cylinder diameter.

British charts of Lake Superior cover the entire north shore. We have them for sale at \$1.

\*Written for the MARINE REVIEW by W. F. Durand, principal of Graduate School of Marine Engineering and Naval Architecture, Sibley College, Cornell University.



### Naval Contingent Snubbed—Chicago Marine.

WESTERN OFFICE, MARINE REVIEW,  
No. 701 Phoenix Building, CHICAGO, Ill., July 20.

The representatives of Uncle Sam on the lakes were never given a more unmistakable snub than they received when the Viking ship reached here last week. These beautifully uniformed gentlemen have been as hot as was permissible by the dignity of their positions. Capt. Anderson, it seems, came from Detroit by rail quietly and witnessed the reception of the Spanish caravals the week before. He was not much struck with the course of the naval officers on that occasion. The naval parade was nearly spoiled by the Michigan, which was at its head, crawling along the water front at two miles an hour, and the general layout did not suit him either. It so happened that the reception committee did not place a single guest on board any of the government vessels, and the Andy Johnson was given the cold shake twice on the trip down from Milwaukee. Capt. Davis was so roiled that he said he would not have towed the Viking at all had he known the way he was to have been treated. Notwithstanding the fact that the naval officers were so greatly displeased, the naval parade in honor of the Viking was the finest ever given here. Never were so many people on the water before at one time and the affair was a great success. As between the reception to the caravals and that to the Viking, the latter was so far ahead that no comparison can be made.

The daily papers have been publishing detailed accounts of the drill of the life-saving exhibit at the fair grounds, under the caption "How Lives Are Saved". It is very good reading matter, but how different from the accounts of the big squall published by the same papers ten days ago. In the first instance the life-savers were showing the people how lives might be saved in case of wrecks, but the other contained a sad account of how people were capsized from a small boat and drowned almost within hail of one of Uncle Sam's life-saving stations, abandoned by its crew on account of the stupidity and what has been called criminal negligence of the officers of the service. How lives might be saved proved a good object lesson to world's fair visitors, but how lives are saved in storms, while not done amid the applause of assembled thousands, would be much more to the credit of the service.

The Captains' Club, which was started by Capt. Thomas Clark of the schooner Herschel a short time ago, has already reached a membership of ninety-one. The members state that they are waging a successful war against the Seamen's Union, and that they can hire all the men they want at \$1.50 per day, while the union men want \$2.00. With over ninety vessels tied to the docks waiting for lumber cargoes, it would be a peculiar circumstance if sailors held together in their demand for high wages in a dull time and they are willing to work now at 50 cents off and not kick about hours.

The tug business here catches the dull times like everything else, and there are now nearly half the tugs engaged in vessel towing tied to the docks. One outside boat is said to have cruised around for over a week, and then brought in one lone lumber hooker from somewhere northeast of Milwaukee.

Capt. T. G. Butlin, the former president of the Goodrich line, is leading a comfortable retired life. He mingled with the marine men on the river the other day for the first time this season. With Capt. Cyrus Sinclair and several other well known figures he got on board the Dunham tug Robbie Dunham and went out to greet the Viking ship.

### A Life Saver's Reward—Buffalo Matters.

Special Correspondence to the MARINE REVIEW.

BUFFALO, N. Y., July 20.—Winslow W. Griesser passed through Buffalo last Saturday on his way to take charge of the new life-saving station at Fort Niagara, stopping to take the oath of service at the dock office. It may not be regarded as remarkable, yet there is something quite as near the heroic in its constancy as we often encounter now-a-days, manifested by Keeper Griesser in his steady devotion to the service in which he has now taken a responsible position. He was made No. 1 in the crew at the Point Marblehead station, near Sandusky, when the station was opened in 1876 and he has served in that position till his promotion has come seventeen years later. It was such constancy as this that made the Roman Empire possible. Now the keeper has what Supt. Chapman regards as the ideal station of the district. A modern house with good appointments for himself and family, no city dirt or smoke, plenty of companionship through the garrison and none too much to do. Not a princely salary, to be sure, but a clean, honorable position, out of the reach of politics and one which good behavior will make sure. Keeper Greisser was a sailor and fisherman in his earlier days and is in every way fitted for the place. As yet there is no equipment for the crew and nothing will be done till it is made up. It is probable that this will be done in readiness for the fall storms.

Buffalo has pretty thoroughly joined the majority in letting lake business slack off. Coal shipments dropped to about half the previous record last week and everybody complains of dullness. A few vessels have laid up here, though part of them have obtained loads and gone out again. Nothing is really brisk but canal freights, which are very firm at 4½ cents on wheat to New York, a good high rate, with loads plenty. Lake rates on coal have remained without change for so long that they may be regarded as a fixture till things start up again. Chicago commands 50 cents, Milwaukee 45 cents, and most other Lake Michigan ports, including Saginaw, the Portage Lake district and the Sault

40 cents, with Bay City 35 and Lake Superior generally, Toledo and Detroit 30 cents. These are low figures, but it will take more demand than we have now to raise them.

Manager John Shaw found both his big steamers, the Pope and the Selwyn Eddy stranded here over Sunday this trip and had to send them elsewhere for up loads. Capt. Shaw of the Pope sent off a message from the dock office and the manager offered to pay for it. "No, you don't," remonstrated the captain, "I am making more money just now than you are".

People who took no stock in the whalebacks are snickering at their discomfiture. Capt. Alex. McDougall doubtless really believed that they would make money hand over fist when low rates laid everything else up, but he finds that he has to retire them along with the rest. This pinch proves them merely good lake boats and has already taken the phenomenal kink all out of them.

### St. Lawrence River Traffic.

Special Correspondence to the MARINE REVIEW.

KINGSTON, Ont., July 20.—The boom in St. Lawrence river business that was looked for this season has not materialized. It was expected that the travel to the world's fair would make business active among the Thousand Islands and all along the river, but the regular steamers are doing only a small trade and the extra boats are being laid up. The Richelieu and Ontario company has had very poor luck. The steamer Carolina ran aground on her first trip, engines of several of the Montreal boats were damaged, and the other day the steamer Bohemian ran aground at Cateau rapids and remains there. The Collinsby Wrecking Company is working on her with pontoons, and it is said there will be much difficulty in getting her off.

This is the first season in twenty years that the Kingston and Montreal Forwarding Company has had oats from Chicago, but the English trade now demands this grain. During June the Ogdensburg Transfer Company's elevator received 1,520,000 bushels of grain and delivered 1,250,000 bushels, making nearly 3,000,000 bushels handled in one month. This is the largest amount that has ever been handled in one month by this elevator, and probably the largest amount ever handled by an elevator of its size in the same period of time. The shovelers here are rejoicing over the great grain transporting business. The men are averaging from \$25 to \$40 each per week for discharging vessels, and have been making these figures for two months past.

A Canadian commercial man who has just made the trip to Chicago and return on a steam yacht says: "From Kingston to Port Dalhousie we never sighted a smoke stack or a sail, but we had no sooner entered Lake Erie than both steamers and sailing vessels became numerous and grew in numbers as we moved westward. And such big vessels! They almost took my breath away. Canadians do only a little bit of trade alongside the Americans. Another great difference between the two governments is in the light-house service. The Canadians have measly little lights at long distances; the Yankee lights bristle all along the coasts, while the life saving crews are organizations to be proud of. Canada is far behind in the race on the inland waters."

### The Submarine Boats.

Special Correspondence to the MARINE REVIEW.

WASHINGTON, D. C., July 20.—Secretary Herbert has received the report of the board of officers appointed to consider the plans recently submitted for the construction of a submarine torpedo boat. The board seeks for opportunity to make further investigation into the merits of the Baker and Holland boats and to hear personally from the inventors, both of which requests Secretary Herbert has granted. The two boats selected for examination have some points of resemblance in general aspect. They are of the same size, measuring nearly 150 tons when submerged. Each uses steam as a propelling power when on the surface and electricity, supplied by storage battery charged by the main engines, when submerged. When they dive under water both boats house their smokestacks and seal all openings with iron plates.

The essential feature of the Baker boat is, of course, the propelling apparatus which also serves to submerge her. This consists of two screw propellers, one on either side, so arranged on a transverse shaft passing through the middle of the boat at the center of gravity that they can be turned at different angles. When the boat is to be submerged these propellers are turned upward and drive the hull under water, and when the desired depth has been reached the angle is adjusted so as to drive the boat in a horizontal line. By revolving them slowly the boat can be maintained at any place.

The Holland boat depends for her submersion on what are known as fin rudders. They are arranged on a horizontal plane, and when the propeller at the stern drives the boat ahead a slight inclination of the rudder will cause her to dive beneath the surface. This boat has another rudder so arranged as to cause her to steer automatically a straight course when under water, a most important point when the darkness below the surface is considered. She also has a regulator for her fin rudders, made on the plan of a Whitehead torpedo, which will keep the boat at any desired depth while she runs along under water. Each of the boats are fitted with tanks filled with compressed air, which will insure a quick return to the surface in case of any derangement of the propelling apparatus. The Baker boat is designed to make a speed of twelve knots above and ten knots under water and the Holland boat to make fifteen knots on the surface and eight knots beneath.



### Iron Mining.

In his last annual report, printed in this issue, Mr. J. S. Fay, who recently retired from the management of the Lake Superior Iron Company places the value of the company's vessels, mining equipment etc. at \$20 a share, and the valuation is undoubtedly conservative. This is exclusive of the mines and thousands of acres of mineral lands owned by this big corporation, and yet the stock of the company would not at this time bring more than \$25 a share, and it is doubtful if any great amount of it could be disposed of at that figure if offered for sale. Stock in the Chandler company, which was upheld during the dull period preceeding the present demoralized conditions in mining matters, would not bring at the present more than \$35. But even these figures cannot be quoted as actual values, as there is absolutely no market for mining shares. Investors outside of the controlling owners of the mines have lost all interest in these securities, and it is evident that when the business is again put upon a steady footing there will be a reduction of margins in all its parts.

On Wednesday the 12th inst., 355,581 tons of ore had been shipped from Two Harbors. The shipments of the different mines is as follows: Chandler 177,791 tons, Minnesota 154,396, Canton 14,612, Cincinnati 8,782.

### Minnesota Iron Company.

As was expected the Minnesota Iron Company, alike to all other mining companies in the Superior region, had a very large amount of money tied up in ore both at the mines and at Lake Erie ports when its annual meeting was held a few weeks ago, and this is largely the cause of the dividend being passed. The following statement of the affairs of this big company, given out by the management, will prove interesting:

The capital stock of the Minnesota Iron Company is \$16,500,000. The property of the company now consists of the iron mines in Township 62-15, St. Louis county, Minn., thoroughly equipped for business with the most modern machinery, and mining now at the rate of 600,000\* tons per year, and with not less than 4,000,000 tons of iron ore in sight; about 11,000 acres of land selected with reference to mining interests; about 2,700 acres of land at Two Harbors, on Lake Superior, the shipping port for the Duluth & Iron Range Railroad; the Duluth & Iron Range Railroad, 135 miles in length, thoroughly equipped in every respect, its ore docks, machine shops, and yards at Two Harbors alone costing more than \$1,200,000, and with a state land grant of about 500,000 acres, of which 184,000 acres have already been patented to them; the Chicago & Minnesota Ore Company, owning a majority of the stock of the Chandler mine, mining this year about 700,000\* tons of ore; and also owning the Canton mine, mining this year about 100,000\* tons; also various other organized companies owning in the aggregate about 24,000 acres of timber and mineral lands.

The company also own eight large steel steamers, four built in 1890, two in 1891 and two in 1892, their aggregate carrying capacity between docks at Two Harbors and Lake Erie ports being about 500,000 tons per annum. The steamers cost over \$1,600,000. Much of the property mentioned, including the steamships, is represented by the stocks and bonds of proprietary companies, all of which are in the treasury of this company. The Duluth & Iron Range Railroad is subject to a mortgage of \$5,209,000, interest 5 per cent. per annum, payable semi annually. The net earnings of the entire property owned by the Minnesota Iron Company for the past five years, after paying interest on railroad bonds, have been as follows:

Year ending April 30, 1889.....	\$632,900.45
" " " 30, 1890.....	932,578.05
" " " 30, 1891.....	1,570,446.36
" " " 30, 1892.....	1,157,846.48
" " " 30, 1893.....	1,351,721.62
Total.....	\$5,645,492.96

The Minnesota Iron Company has paid the following dividends:

Year ending April 30, 1891.....	\$840,000.00
" " " 30, 1892.....	915,000.00
" " " 30, 1893.....	990,000.00
Total.....	2,745,000.00
Leaving a balance of surplus earnings of.....	2,900,492.96

Out of this surplus the entire payment for the steamers be-

fore mentioned has been made, as well as large expenditures in improvement and enlargement of docks, track, machine shops, and yards of the railroad company, and machinery and other improvements at the mines, all believed to have been wise expenditures in the interest of the company.

On May 1, 1893, the Minnesota Iron Company had on hand:

Ore in stock at mines, 334,770 tons at cost.....	\$468,678.00
Ore in transit, 2,101 tons at cost.....	4,843.59
Ore at Lake Erie ports, 235,050 tons valued at.....	\$1,014,753.81
Less ore due to customers, paid for but not taken.....	513,485.75
Cash, bills and accounts receivable, all believed to be good.....	501,268.06
Supplies at mines.....	678,412.80
Good railway first mortgage bonds.....	95,977.45
Mining stock valued at.....	\$640,000.00
	40,210.00
Total.....	680,210.00
Its total indebtedness was.....	2,429,389.90
	379,094.37
Balance.....	\$2,050,295.53

\*These estimates were made at a time when the present depression in the iron trade was unthought of.

### Lake Superior Iron Company.

The report of Treasurer J. S. Fay, Jr., of the Lake Superior Iron Company for the year ending April 29, 1893, presents some interesting facts regarding the affairs of this company, which is probably next in importance to the Minnesota company among the mining concerns of the Lake Superior region. The report is Mr. Fay's final report as treasurer and managing director, (he has since been succeeded by Mr. W. D. Rees of Cleveland) and he notes that since he assumed the management in November, 1881, the company has paid \$3,882,000 in dividends. The net reserves have increased from \$402,653.07 to \$854,426.60 and the active assets, such as cash, bills receivable, stocks, steamships, etc., would readily realize \$20 per share in cash, leaving all the lands, mines equipment, etc., intact and entirely free from debt. For the year covered by the report the gross earnings were \$1,370,783 and expenses, \$1,398,646, making a deficit of \$27,863; but ore on hand is reckoned as cash, making the net earnings \$172,030, after crediting depreciation account with \$155,688 to offset a reduction in the valuation of the company's steamers, cost of special repairs at the mine, etc. The company had 196,608 tons of ore in stock May 1, 1892, mined 474,087 tons during the year, shipped 370,269 tons, and had 295,426 tons at mine April 29, 1893. The company's six steamers, two of which were finished too late for a full season's work in 1893, transported 87,366 tons of ore from Marquette and 221,150 tons from Escanaba for the company's account, at average market rates, and 19,530 tons of ore, 79,631 tons of coal and 2,463 tons of grain at open market rates for outside customers, making a grand total of 410,140 tons. After writing off \$67,550.74 for depreciation, the steamers earned a trifle over 6 per cent. on \$52,550.74, which was their book valuation. A balance sheet, date of April 26, 1893, is as follows:

Real estate and mining property.....	\$1,273,642 65
Steam ships (6 steamers).....	\$785,000 00
Iron ore.....	787,691 45
Agent's inventory.....	48,223 54
Agent's cash.....	1,657 49
Agent's acc't rec'ble.....	5,793 44
Notes receivable.....	55,674 47
Accounts receivable.....	22,738 85
Cash.....	142,117 32
Suspended debts.....	28,567 51
Atlantic Iron Co stock (750 shares).....	131 22
Brown, Bonnell Iron Co. stock (79 shares).....	25 00
Rents, earned.....	3,950 00
Office furniture, in Boston.....	200 00
	100 00
Treasury stock.....	1,826,195 82
Steam ship operating (new acc't).....	400,000 00
Notes and accounts payable.....	4,886 11
Debt at mine, as follows:	\$56,312 12
Pay roll.....	
Accounts payable.....	38,965 73
Guarantee and benefit fund.....	25,968 31
	28,870 08
Interest, balance vs. Co.....	93,804 12
Capital stock.....	181 74
Reserves.—	2,500,000 00
Guaranty.....	
Depreciation.....	260,505 27
Profit and loss.....	416,640 83
	177,280 50
	854,426 60
	\$3,504,724 58
	\$3,504,724 58



# MARINE REVIEW.

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

Chicago Office, Western Union Building, 706 Phoenix Building.  
Published every Thursday at No. 516 Perry-Payne Building, Cleveland, O.

SUBSCRIPTION—\$2.00 per year in advance. Single copies 10 cents each.  
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The books of the United States treasury department contain the names of 3,657 vessels, of 1,183,582.55 gross tons register in the lake trade. The lakes have more steam vessels of 1,000 to 2,500 tons than the combined ownership of this class of vessels in all other sections of the country. The number of steam vessels of 1,000 to 2,500 tons on the lakes on June 30, 1892, was 321 and their aggregate gross tonnage 534,490.27; in all other parts of the country the number of this class of vessels was, on the same date, 217 and their gross tonnage 321,784.6. The classification of the entire lake fleet is as follows:

Class.	Number.	Gross Tonnage.
Steam vessels .....	1,631	763,063.32
Sailing vessels.....	1,226	319,617.61
Canal boats.....	731	75,580.50
Barges.....	69	25,321.12
Total.....	3,657	1,183,582.55

Tonnage built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

	Number.	Net Tonnage.
1888.....	222	101,102.87
1889.....	225	107,080.30
1890.....	218	108,515.00
1891.....	204	111,856.45
1892.....	169	45,168.98
Total.....	1,038	473,723.60

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.

	St. Mary's Falls Canal.			Suez Canal.		
	1892.	1891.	1890.	1892.	1891.	1890.
No. vessel passages	12,580	10,191	10,557	3,559	4,207	3,389
Ton'ge, net regist'd	10,647,203	8,400,685	8,454,435	7,712,028	8,698,777	6,890,014
Days of navigation..	223	225	228	365	365	365

Entered at Cleveland Post Office as Second-class Mail Matter.

READERS of the Coast Seamen's Journal, San Francisco, Cal., have been very much interested in the story of the Jefferson Borden mutiny, which has been running through several numbers of that journal. It is of thrilling interest and although written by one of the seamen serving life sentence for the mutiny, the account given bears the stamp of truth. Not only in this case but in many others, seamen are no doubt mistreated by unprincipled masters and mates. There are undoubtedly some extenuating circumstances on the other side, but a man as intelligent as the writer of the account has proven himself to be has probably been punished sufficiently for the crime, even if he was entirely to blame, by the seventeen years of imprisonment to which he has been subjected with a fellow seaman under similar sentence. The object of printing the story at this time is to show the claim for clemency which is set forth in a petition for the pardon of the men, which is now being signed for presentation to President Cleveland.

THE story from Alaska about the United States man of war Mohican being fired upon in Behring sea and disabled by the Hawaiian merchant steamer Alexandria created considerable interest in marine circles around the lakes. Commander Nicoll Ludlow, who is in charge of the Mohican, the flag ship of the Behring sea fleet of eight vessels, was until a year ago stationed at Chicago as inspector of the ninth light-house district. He is an efficient officer and has had his share of sea duty, but will at least be compelled to stand the fire of a number of joking letters from friends on the lakes as the result of this story, whether it proves true or not.

It is a very popular belief that when the water enters the stoke hold of a sinking vessel the boilers burst. Attention has been directed to this error through discussion in English journals regarding the sinking of the Victoria. As a matter of fact

there is not an instance on record of the boilers of a sunken steamer being found on examination to be burst. The cold water merely condenses the steam in the boiler, and thereby creates a vacuum, and instead of there being a bursting pressure, there is actually a collapsing pressure. What gives rise to the bursting theory is that the cold water entering the furnaces is partially converted into steam, and this follows the path of least pressure, with the result that a body of smoke, steam, and ashes is forced through the tubes up through the funnel.

THERE is nothing surprising in the fact, that though shipments from all other ore shipping ports are very much behind those of previous years, the movement from Marquette on June 1 was about 50,000 tons ahead of last year. Marquette's gain is explained by the low lake freight rate of 50 cents, which was the same as the rate from Escanaba, notwithstanding that the rail rate from the mines to Marquette is 20 cents lower than the rate from the mines to Escanaba. Ninety cents is a phenomenally low figure for rail and lake charges on ore delivered at Ohio ports from the Marquette district. There was some ore carried by way of Marquette at that figure and a very large amount of it at 95 cents, and shippers who could in any way secure ready cash to pay the freight were, of course, alive to the advantages offered them.

AN English exchange prints a list of ten vessels launched by Harland & Wolff of Belfast, Ireland, during six months ending June 30, last. They are all of steel, five are twin screws, and their aggregate gross tonnage is 38,146, or an average of 3,814 tons. Still, a New York contemporary discredits our statement that this is the greatest ship building establishment in the world. We are willing to take on a fair share of home pride, but in view of such a record as this it is absurd to proclaim greatness for the plants of the Newport News company, the Cramps, or any other ship building concern in America.

It took Gen. Poe of the war department just a few days to overcome the objections of a Canadian collector of customs at Amherstburg to dredging a portion of the 20-foot channel in Canadian waters near Bar point. He dredged the big Lime-Kilns cut without any interference, but the light house board raised an international question over putting two lights of a value of about \$300 on the edges of this same channel.

## The Mineral Industry.

The MARINE REVIEW has received from the Engineering and Mining Journal, New York, a volume of 628 pages entitled "The Mineral Industry, its Statistics, Technology and Trade for 1892." As it is designated Vol. I, it is evidently the intention of the publishers to put forth companion volumes each year. There are chapters on aluminum, antimony, asbestos, asphaltum and other minerals of that class, while large portions of the book are devoted to iron, steel and copper, and the mineral production of each country is reviewed separately. In the statistics Mr. Rothwell, editor of the Engineering and Mining Journal, has brought together the results of the eleventh census, the work of the geological survey, the bureau of statistics of the treasury department, the bureau of the mint, the Iron and Steel Association, etc., with modifications; and for 1892, in addition to the usual and generally accessible trade reports for iron, steel, anthracite, quicksilver, petroleum, and the gold and silver statistics of the mint officials, has added the results of an extensive original canvas of the various branches of the industry. Among the names of the gentlemen credited with the preparation of separate chapters are those of several well-known specialists. The enterprise shown in undertaking a publication of this magnitude is highly commendable, and the comparative promptness with which the results have been presented to the public is especially creditable. The Imperial Statistical Bureau of Germany wrote in reference to the book that it was specially valuable on account of its early publication, enabling readers to become completely acquainted, a few weeks after the close of the year, with the mineral productions of the past. The Scientific Publishing Company, 27 Park Place, New York, will mail the book on receipt of \$2.00.



### Around the Lakes.

A trial trip of the Mohawk, sister ship of the Western liners Harlem and Hudson, all built by the Detroit Dry Dock Company, will take place in a few days. This steamer will very probably show her heels to some of the "fast ones" in the package freight trade.

Thirty-one hundred tons of soft coal is a big load for a vessel like the Vega, which was recently built by the Globe Iron Works Company for Capt. Frank Brown and others of Lorain. She has just delivered a cargo of that size at Lorain. There is little doubt that the Vega is one of the best business boats on the lakes.

Collectory of Customs Gary of Cleveland has asked the treasury department for an opinion as to whether reports should be made to customs collectors by fishing tugs going beyond the ports in which they are located in pursuance of fishing business, whether to foreign waters or not. There has been doubt about this question in all of the lake customs districts.

The low rudder forward in the new side-wheel steamer City of Mackinaw, built recently by the Detroit Dry Dock Company for the Detroit and Cleveland Steam Navigation Company, is reported to be of great service in handling the boat. She can be backed up stream in the Detroit river and other places where time is valuable with little more difficulty than is found in running her forward.

Canada's marine department corrects a previous notice regarding the location of the schooner R. J. Gibbs. The vessel lies  $1\frac{1}{2}$  miles S. E. by S. from Bar point lightship, Lake Erie, and almost directly in the track of vessels between Detroit river and Point Pelee. The wreck is under water with the exception of one mast, which now marks the vessel. The channel to the north of the wreck is about  $3\frac{1}{2}$  miles wide, but vessels passing in the night should keep to the northward to avoid danger.

The Northern Steamship Company paid M. A. Bradley and others for sinking the schooner Fayette Brown in a fog near the "Dummy," Lake Erie, two years ago, and they have a right, of course, to claim ownership of the vessel. It would seem from the action of Capt. Hackett and others of Amherstburg, in attempting to remove the wreck, that the Canadian government looks upon it as an obstruction to navigation, but the steamship company is said to have contracted with the Murphy Wrecking Company of Detroit to raise the schooner as soon as possible.

General Passenger Agent Schantz of the Detroit and Cleveland line attaches a neat engraving of day and night scenes of the boats of the line on Lake Erie to a postal card in announcing the double daily service recently put in operation between the two cities. By this new service the two big boats, City of Cleveland and City of Detroit, are kept running almost constantly. The boat that leaves Cleveland at 10 p. m. arrives in Detroit at 5:30 the next morning, and at 9:30, four hours later, is again on her way back to Cleveland, arriving at 4:30 p. m. The Detroit service is duplicated by the second boat. On Sunday and Monday the boats run at night only.

### Trade Notes.

The new American line steamers now building at Cramp's yard, Philadelphia, will be fitted throughout with Worthington pumps manufactured by Henry R. Worthington, New York. The order for the pumps also covers Worthington feed water heaters, such as are now used on some of the fastest transatlantic liners, among which are the New York and Paris of the American line.

The Berlin Iron Bridge Company of East Berlin, Conn., is building the roof on the new purifier house for the Philadelphia Gas Company at Philadelphia, Pa. The building will be 70 feet wide and 180 feet long and the roof will be constructed entirely of iron, covered with slate. The new power house for the Worcester Traction Company will also be designed and built by the same company.

An increase in the number of bolts in the valve bonnets, a new form of holding the disk holder in place, and increased thickness of flanges, are improvements made recently in Jenkins valves that suit them especially to high steam pressures, and high pressures are the order of the day in marine engineering. It is the intention of Jenkins Bros. to manufacture this new grade exclusively, and it will not be necessary for customers to order valves for high pressure, as the new valves will be suitable for any pressure. The greatest advance made in any of Jenkins' specialties, however,

is in their manufacture of rubber compound for use where there is high pressure steam. During the past two years experiments and tests have been made in order to perfect the goods which are now offered to dealers without any advance in price, and with the assurance that they will work successfully with high pressure.

### A Big White Star Steamer.

At Harland & Wolff's yard, Belfast, there was launched last week a twin-screw steamer named the Gothic, for the White Star line. This vessel is 490 feet long, 53 feet wide, and 37 feet 6 inches depth of hold, and her gross tonnage is about 7,500. Engineering of London says of her: "Although it is probable that the Gothic may make a few voyages in the New York service, as the bookings of the White Star line continue to be heavy for the autumn season, it is intended that she shall ultimately take her place with her predecessors the Ionic, Doric and Coptic, and the steamers of the Shaw, Savill and Albion company, the Arawa and Tainui, in the New Zealand trade, sailing from Plymouth each month, and calling at Teneriffe, Cape Town and Hobart outward, and Rio de Janeiro and Teneriffe homewards. The distance traversed on each round voyage exceeds 26,000 miles, and in thus, for the first time, introducing twin-screws into the New Zealand trade, the owners of the White Star line believe they are acquiring an additional element of safety. Accommodation has been arranged for 104 saloon passengers amidships. On the quarter-deck aft accommodation will be provided for 114 steerage passengers. In addition to ordinary coal and cargo space, this steamer will be fitted with two refrigerating machines having an insulated capacity for some 75,000 carcasses of sheep. The Gothic will be the largest steamer, as well as the largest carrier, in the Australian and New Zealand trades."

### In General.

The excavation at Hell Gate reef was attended by 21,000 soundings and 8,000 borings.

The scheme for connecting the Baltic and the Black sea by a system of canals, which are to unite the Oder, Vistula, Elbe, and Danube, is making rapid progress. The necessary surveys are now almost completed and the French company which holds the preliminary concession expects to be authorized to start work next month.

John H. Gould, who published the handsome paper "Ocean" a few years ago, has outdone his previous effort in the neat little volume "Over the Ocean," on the American Line. In addition to being full of very fine engravings, a number of lithographs are sprinkled throughout the pages. It contains much information that the ocean voyager needs, and it is supplied on most all of the transatlantic liners when asked for.

### Official Numbers and Tonnage.

The bureau of navigation, E. C. O'Brien commissioner, assigned official numbers and tonnage to the following lake vessels during two weeks ending July 15: Steam—George Stone, Cleveland, O., 1,841.22 tons gross, 1,501.65 net, No. 86,261; Acme, Buffalo, N. Y., 58.52 tons gross, 29.26 net, No. 107,039; James Burns, Erie, Pa., 22.09 tons gross, 12.22 net, No. 77,101; Chas. W. White, Oswego, N. Y., 115.99 tons gross 84.85 tons net, No. 126,980; Fanny M. Rose, Grand Haven, Mich., 33.62 tons gross, 17.75 net, No. 120,939; Ruby, Evansville, Ind., 20.15 tons gross, 17.87 net, No. 111,633; St. Louis, Chicago, Ill., 11.16 tons gross, 6.44 net, No. 116,580; Chicago, Chicago, Ill., 11.16 tons gross, 6.44 net, No. 126,977. Unrigged—Fred Bickford, Oswego, N. Y., 93.38 tons gross, 88.72 net, No. 37,549; June Fly, Sandusky, O., 23.07 tons gross, 32.07 net, No. 46,451; Mary Jane, Sandusky, O., 18.05 tons gross, 18.05 net, No. 51,235; Daniel W. Talcott, Oswego, N. Y., 97.71 tons gross, 92.83 net, No. 35,521.

You should not miss the Nickel Plate excursion to the World's Fair leaving Saturday morning July 22nd.

The last of the series. The Nickel Plate road excursion to the World's Fair, Saturday July 22nd, 1893.

\$10.00 takes you to Chicago via the Nickel Plate road July 22nd.

July 22nd, the Nickel Plate road has a \$10.00 rate to Chicago and return. Train leaves Enclid Ave. at 5:55 a. m., stopping at Broadway depot, Pearl, Lorain and Detroit streets.

Chicago and return \$10.00 July 22nd via the Nickel Plate road.

World's Fair excursion July 22nd \$10 via the Nickel Plate road.

Nickel Plate road to Chicago. World's Fair excursion July 22nd \$10.00.

Ten day excursion to the World's Fair Saturday July 22nd, via the Nickel Plate road.



### Tips from the Man on the Dock.

How modern inventions are destroying sentiment. The other day I noticed a new contrivance which was to succeed the good, old, trusty anchor, the emblem of hope. It was a triangular piece of iron and not unlike the triangle used to keep pool-balls in position on a pool table. Imagine how the classic figure of hope would look with this triangle alongside her starboard side. To have her costume correspond with the new contrivance, she should carry a parasol over her bare head and wear rubbers instead of sandals. We will have to require a new set of jokes to fit this piece of mechanism, and the following anchor story would be a misfit and out of place: An Irishman, coming over to a country where his great executive ability would be properly appreciated, found on the forward part of the ship he was on, a number of large anchors that had not yet been fitted with wooden stocks. He looked them over carefully, and in a careless way tried to lift one. As a true Irishman he scorned to ask any foolish question, contenting himself by asking a member of the crew "Where be thim agoin?" "To New York", was the answer. When the vessel arrived, Mike with his bag, took a place alongside the anchors. After everybody had gone ashore, the mate accosted him with "Are you not going ashore?" "Not yit", was the answer. "What are you waiting for?" "Well, sur, I'm waitin fur to see the man that handles thim picks." He was a judge of picks.

\* \* \*

Let me return to my observations about mates and masters. While it is true that the mate without intelligence and horse sense may do well enough under the eye of the "old man", who will correct him when he slips a cog, and that the same mate will not make a successful master, still it by no means follows that all masters are the reverse of this. Now the barometer is a thing that every school boy understands the principle of. It is simply a scale, or weighing instrument, which indicates the weight of the atmosphere, and observation having taught us that certain meteoric conditions are apt to follow its fluctuations, it has, as a result, found a place in every chart room, simply that by noting its changing conditions the observer may make his own deductions as to what is likely to follow. Now I know a skipper who stands today on the bridge of one of the very finest steamers afloat. He and I and several others sat one evening in a certain hotel, and during the conversation I said something about the varying weight of the atmosphere as shown by the barometer. "Why," said the skipper, "the barometer ain't to tell the weight of the atmosphere; it tells approachin' storms." Here was your navigator for you. And the oddest part of it was that if Torricelli had attempted it he could not have convinced him to the contrary. Some men have a talent for concealing their ignorance, others for exhibiting it. Another instance of the latter was a captain who was so full of his boat and himself, that, not content with bragging his end all it would stand and a little more, he descended, figuratively, to the engine room and threw a little red fire around that department. Said he: "That boat has the best air-pump I ever seen. I see her with forty pounds of vacuum on, laying to the dock." And now how many of you can show where he was out?

\* \* \*

Another thing that is very fatiguing this hot weather is such an item as that from Chicago giving the skipper of the Manitou credit for making up nine hours between Chicago and Mackinaw. In the first place, admitting it to be true, what the devil did the skipper have to do with it. Put the boot on the right foot gentlemen, and say that the engineer did it. And in the next place "it ain't so," even if we did see it in the REVIEW. Just get down to figures for a minute or two and see where you fetch up. Nine hours is going it too blooming strong.

### A Phenominally Fast Launch.

Fi-Seen, or flying arrow in the Japanese language, is the name given to the latest high-speed launch built by Gardner & Mosher, No. 1 Broadway, N. Y. She is intended solely for speed and will certainly make 30 miles an hour. In describing this boat, the Engineer of New York says:

"Those who are not familiar with actual high-speed launches, as distinguished from alleged high-speed, or spurt-boats, so to call them, will be interested in a few facts concerning them. The Fi-Seen is 78 feet long by 9 feet 6 inches beam, that is she is about nine times as long as she is wide. This gives her good stability for a vessel of her size, for there are many steam craft afloat which are ten, and a few even eleven times as long as they are wide. She is built of mahogany upon adequate frames, albeit

they sound light to the reader. These frames are  $1\frac{3}{4} \times 2$  inches and are spaced about 8 inches from centers. The hull consists of two thicknesses of light planking with cemented canvas between them, and is absolutely water-tight without other aid than the copper fastenings. The model is peculiar in that it resembles a barrel in midship section as nearly as any other form; there is no keel, and the bow lines are all straight, (and very handsome they make the Fi-Seen look in the water) while the stern is of peculiar construction. This begins at the extreme stern and extends forward to say 20 feet, where the screw-shaft emerges from the hull. This method of construction prevents squatting, so-called, or burying at the stern, a fault common to all high-speed vessels of light draught, and also prevents the carrying (to some extent) of the water of replacement, for the hull rides on top of it instead of dragging it along with her. The wave of replacement is the water which has been driven aside at the bow and closes in at the stern of a vessel. In some high-speed torpedo boats this wave stands, or stood on the trial runs, 3 and 4 feet above the stern and threatened to come on board momentarily. The stem of the Fi-Seen is covered with a bronze shoe which is brought to an actual knife edge, and a brass rail is carried all round her from stem to stern, giving the vessel a beautiful appearance. The boat has no sheer and nothing above deck except a roomy pilot house and a slight trunk over the boiler a few inches high. There are limited quarters aft and also forward. The draught is 3 feet.

"Naturally the interest of this boat to engineers and yacht owners centers upon the machinery, as it well may, for it is unique even for its kind. High-speed marine engines are quite common, and Mr. Mosher does not profess to be the originator of them, but he has been very successful with them, and this success has been obtained by courage tempered by common sense. The engines are of the quadruple type, with cylinders  $9\frac{1}{2}$ ,  $13\frac{1}{2}$ , 18 and 24 inches by 10 inches stroke, and the boiler is Mosher's patent water-tube marine boiler. All told, the weights are for engine and boiler inside of 9,000 pounds. When we say that the engine is capable of exerting 600 indicated horse power per hour and weighs only 3,600 pounds, we have stated extraordinary facts. This, it will be seen, is only six pounds per horse power exerted, dead weight of engine and all that is on the bed-plate, and is undoubtedly the lightest marine engine so far constructed for actual use in propelling a vessel. The valve gear is of the Marshall radial type, with some modifications introduced by Mr. Mosher, and the working parts, piston, crank-shaft, in fact everything, is forged steel of a high tensile strength; not tool steel be it observed, but machinery grade. The crosshead and guide bar are of the slipper pattern, the former being of bronze with a babbited face. The piston rod, connecting rod and crank-shaft are all bored out, reducing the weights materially. Externally the piston rods are perhaps  $1\frac{3}{4}$  inches diameter, but the removal of the center takes off part of the weight. The connecting rod end on the crank pin has a peculiar box which no one else but Mr. Mosher ever used. A watermelon with the stem coming out of the side instead of the usual place represents it as well as any familiar object can. This bearing is very long and there is only one bolt through the halves of the boxes, one of which is forged solid on the rod itself. It is one of the features of this engine that everything is as solid and with as few artificial fastenings as possible. Naturally, with a piston and connecting rod vibrating 1,200 times a minute—as these do at high speed—there must be as few loose parts as there can be, and Mr. Mosher has brought them down to their lowest terms. All the valve motion joints are bushed with bronze, and every refinement of the best engineering practice has been introduced throughout.

"The boiler has 1,200 feet more or less heating surface, and 33 square feet grate surface. It has shown by an evaporative test, conducted by Prof. James E. Denton, professor of engineering at Stevens Institute, over 600 horse power per hour with forced draught or very nearly 20 horse power per square foot of grate surface. The working pressure is 275 pounds per square inch, with capacity to go much higher than this if needed. The coal capacity of the launch is 3 tons, which is carried in bunkers alongside. The screw is 36 inches diameter with four blades, and is necessarily in solid water, since it is under the boat. The pitch is not given to the public by Mr. Mosher."

The American Shipmasters' Association of No. 37 William street, New York, publishers of the Record of American and Foreign Shipping, classed last week the American bark Magunticoot, British schooner Golden Rule, British barkentine Curacoa and British half-brig Moss Glen.



**PATENTS.**

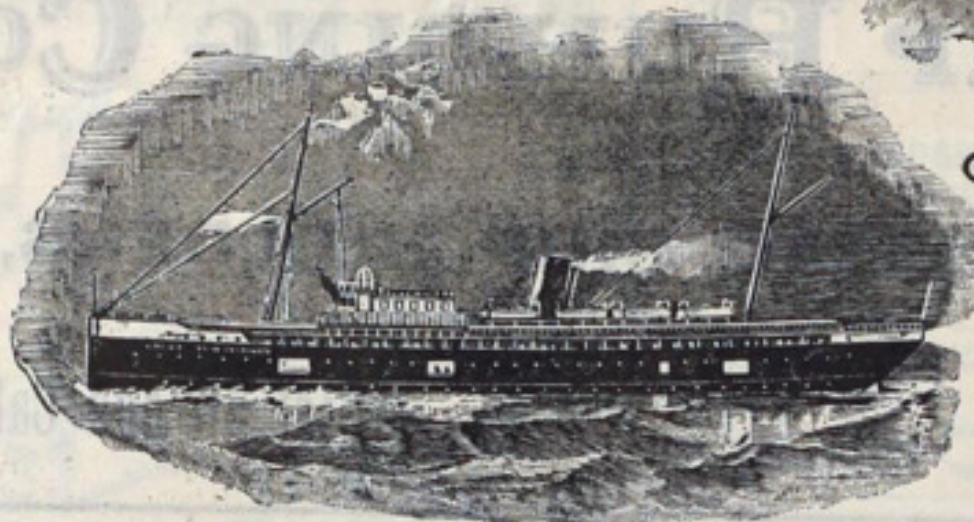
**FRANK L. DYER,**  
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Washington, D. C.

References: American Steel Barge Co.;  
Capt. Alexander McDougall.

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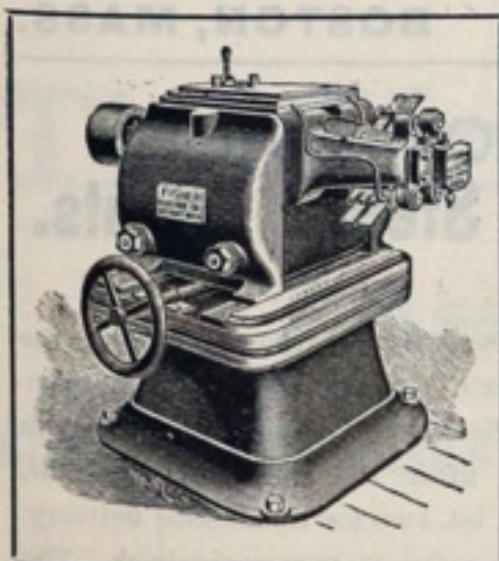
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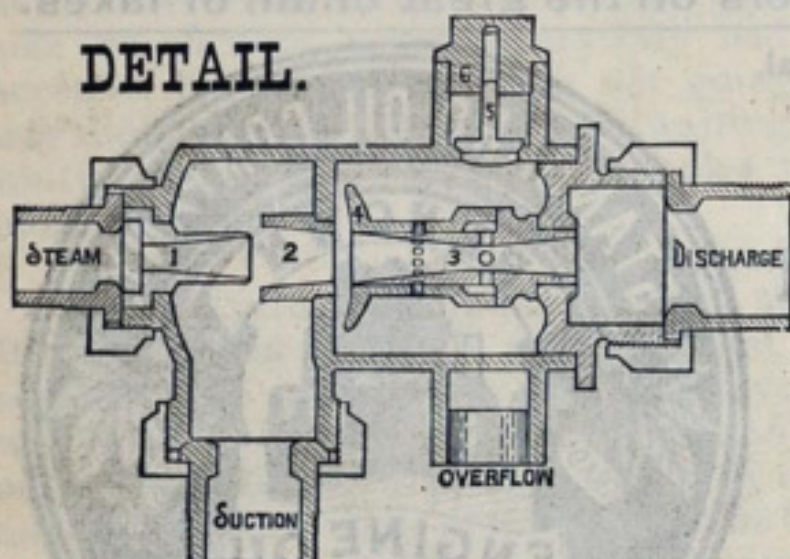
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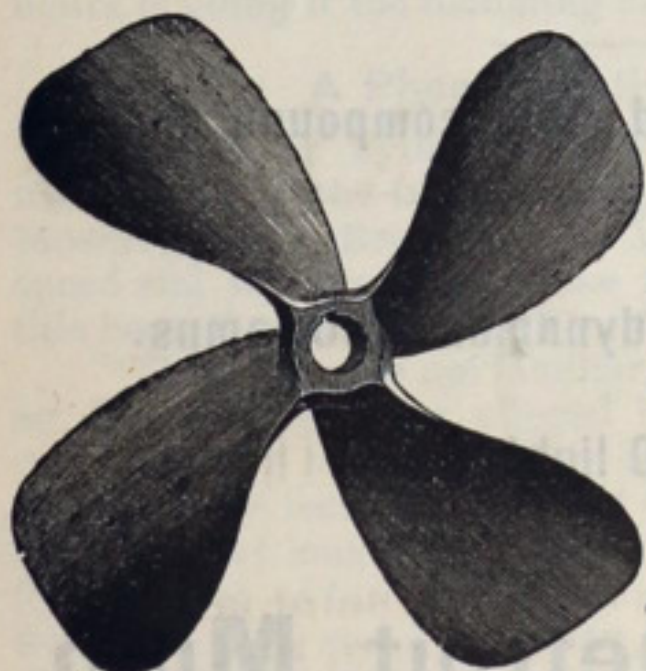
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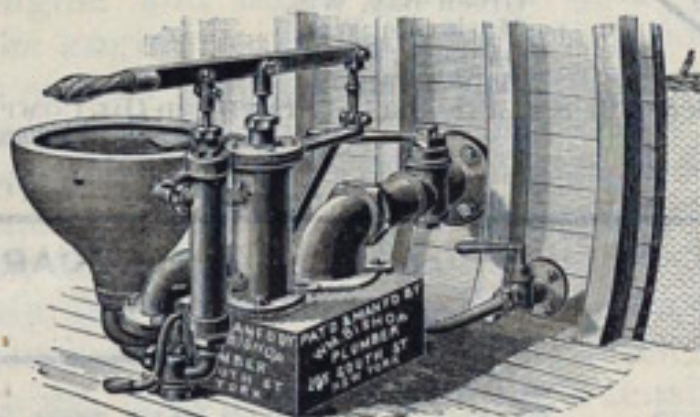
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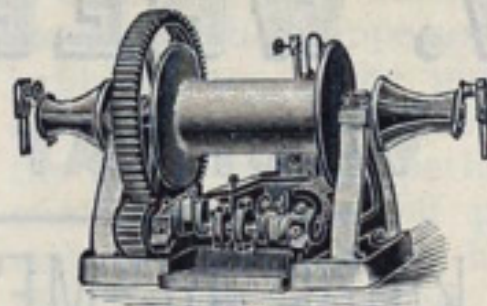
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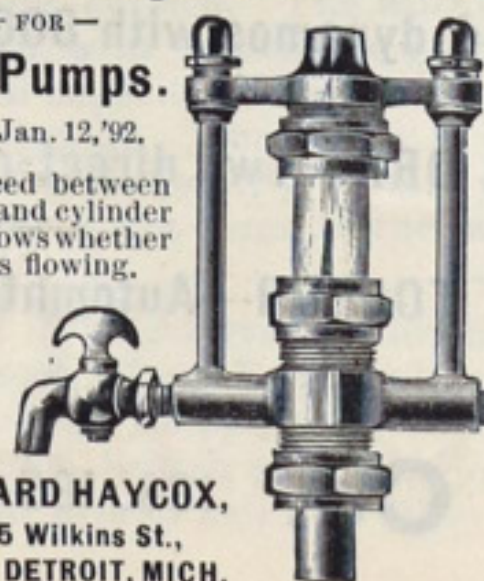
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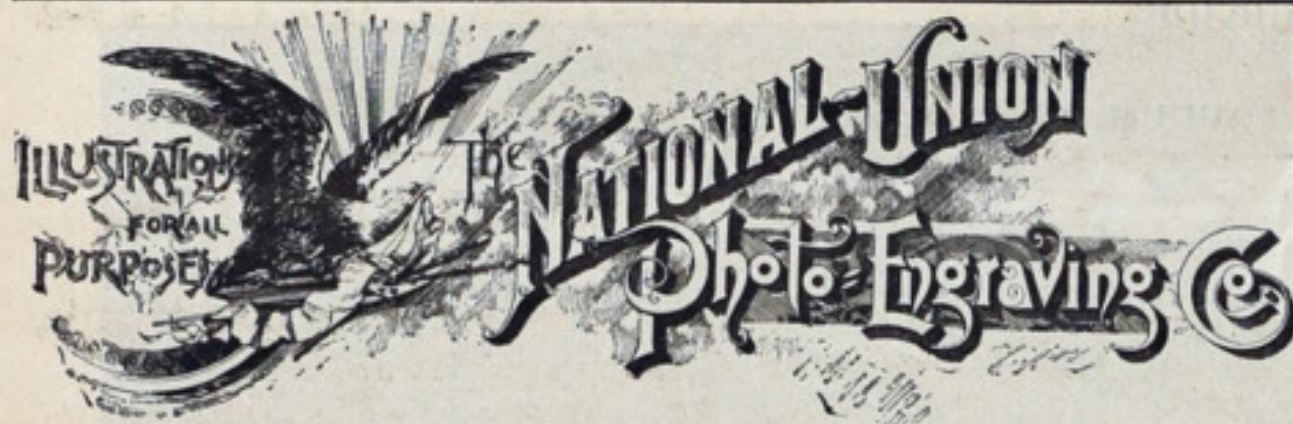


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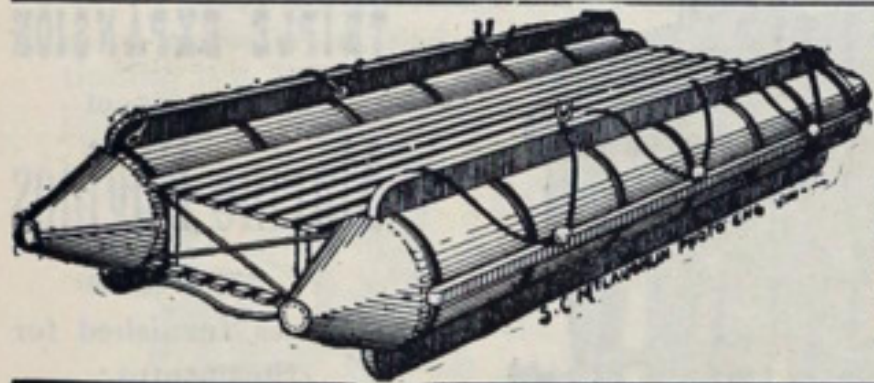
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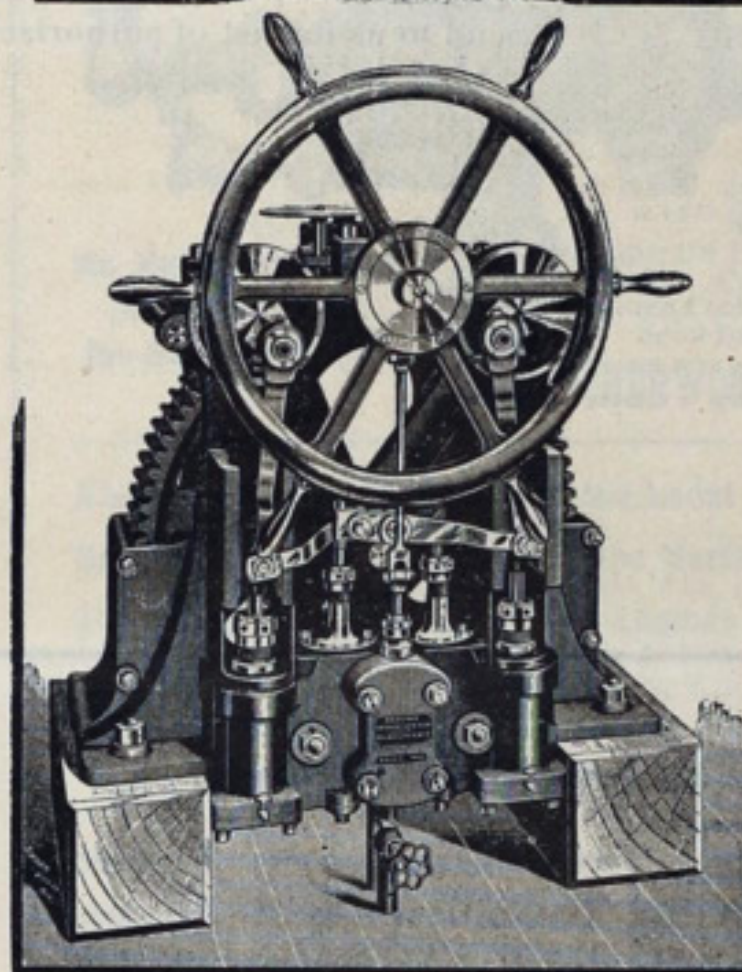
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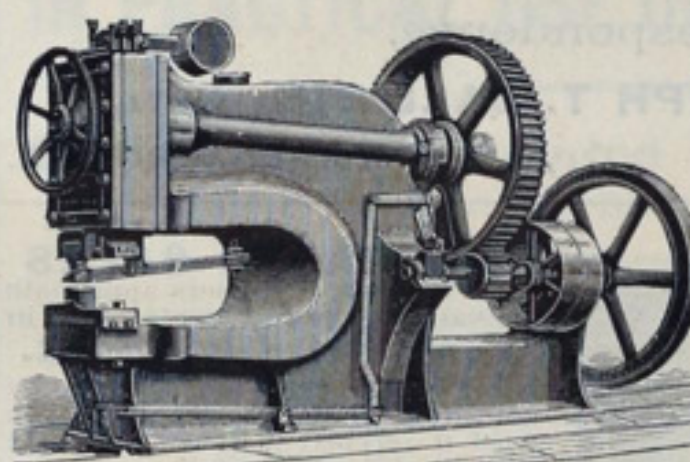
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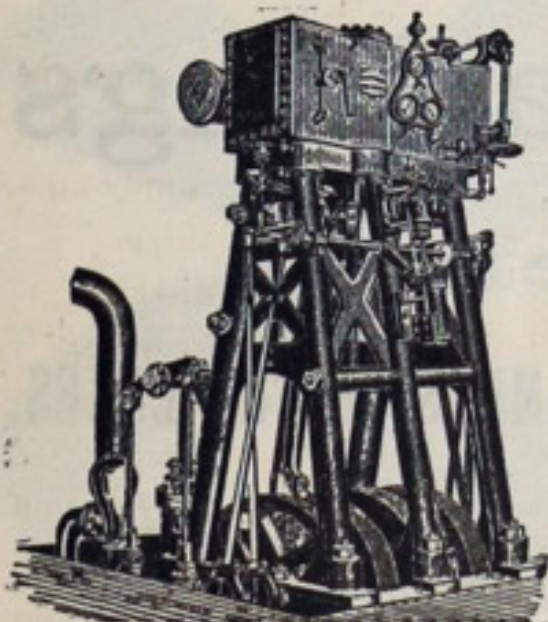
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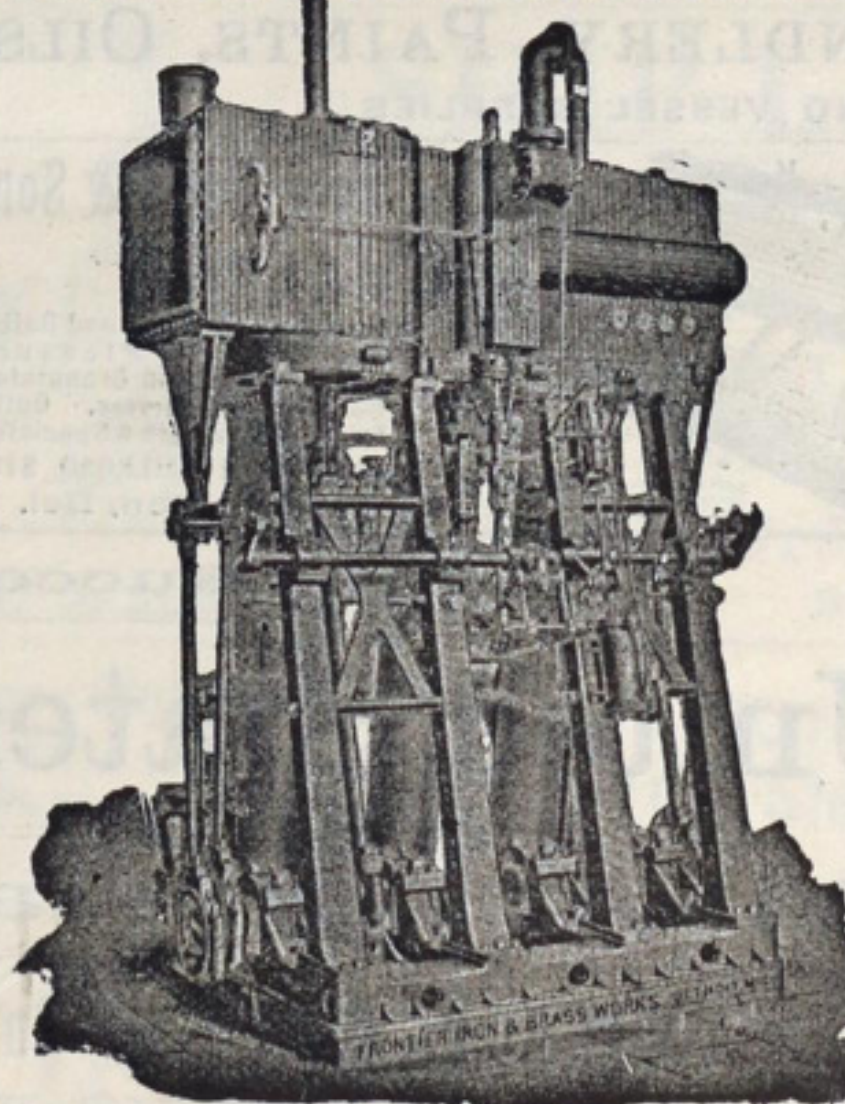
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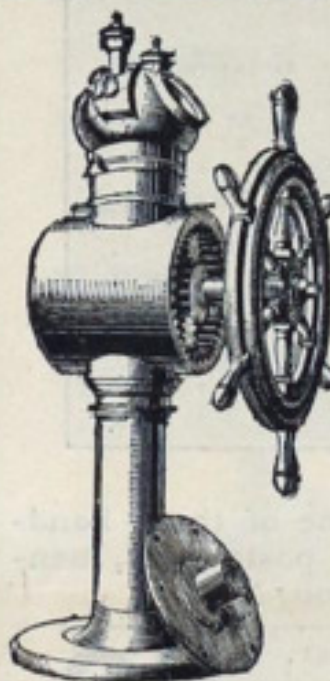
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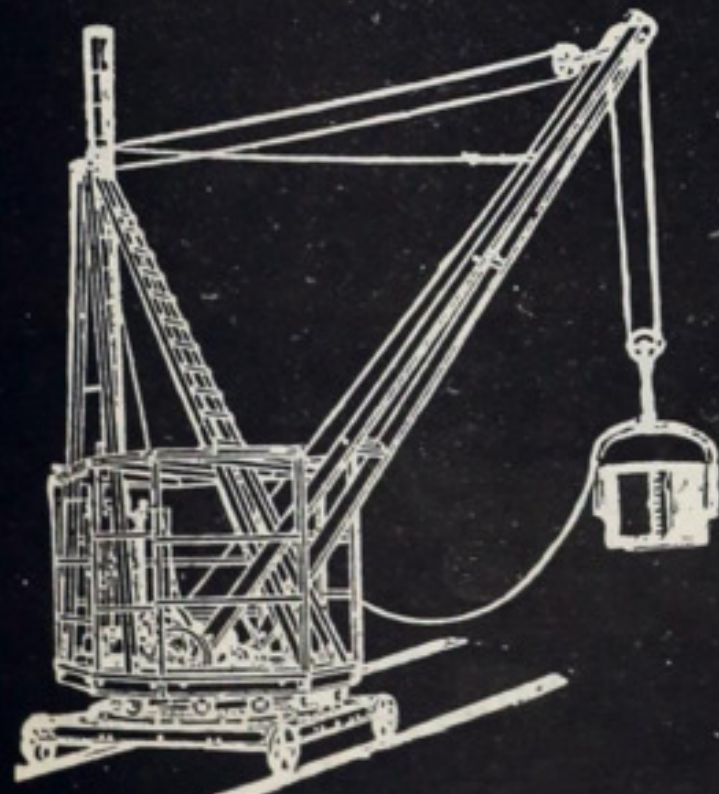
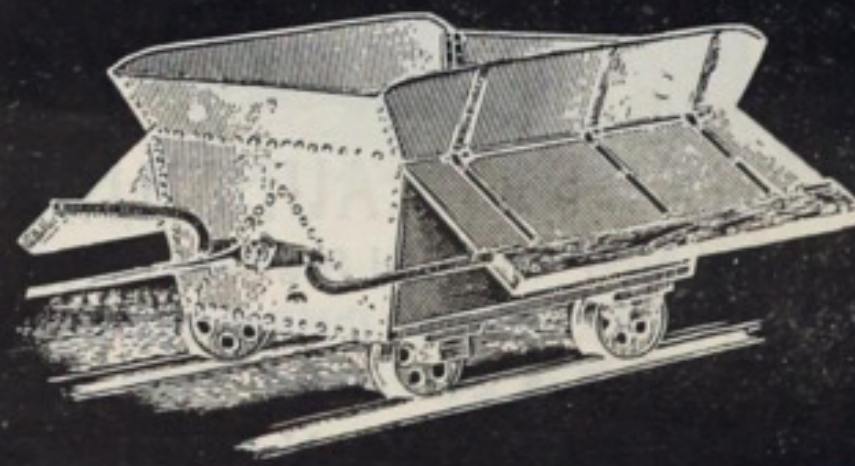
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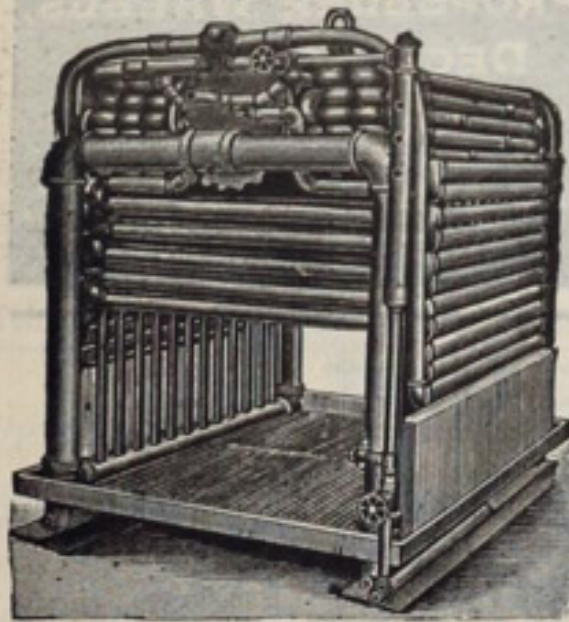
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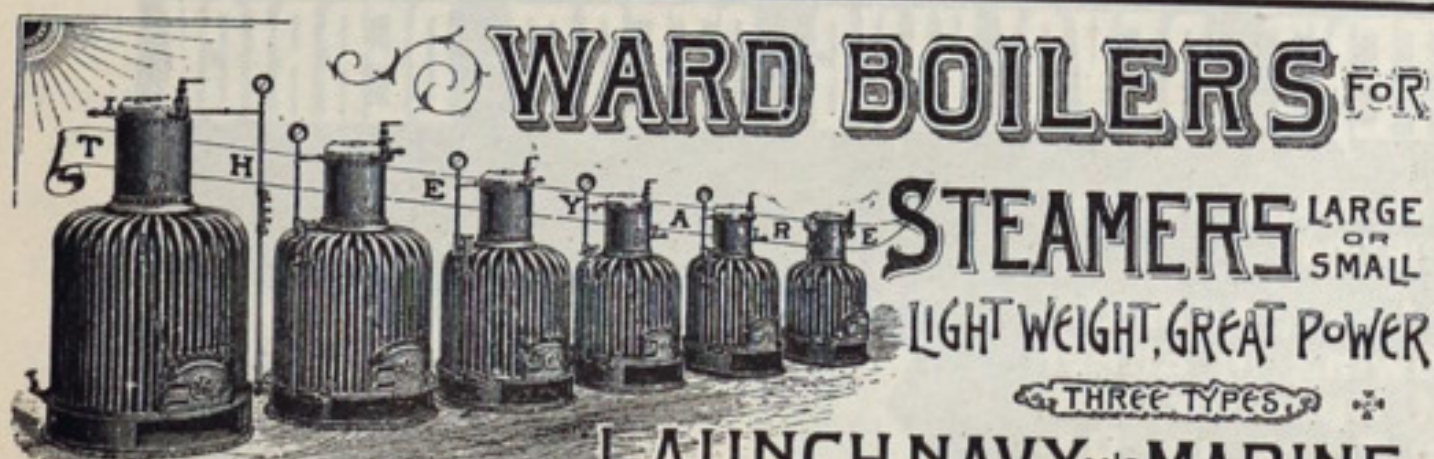
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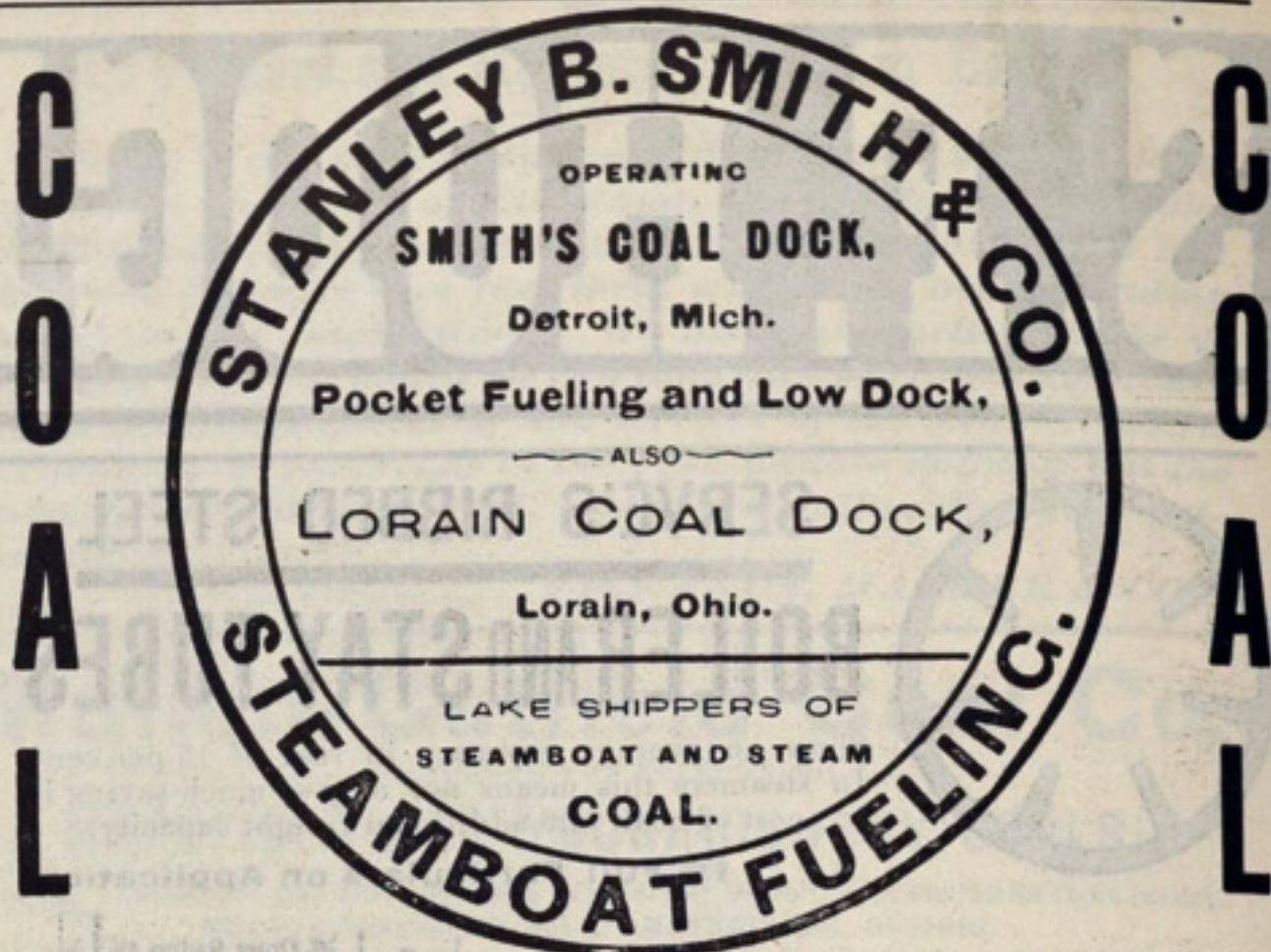
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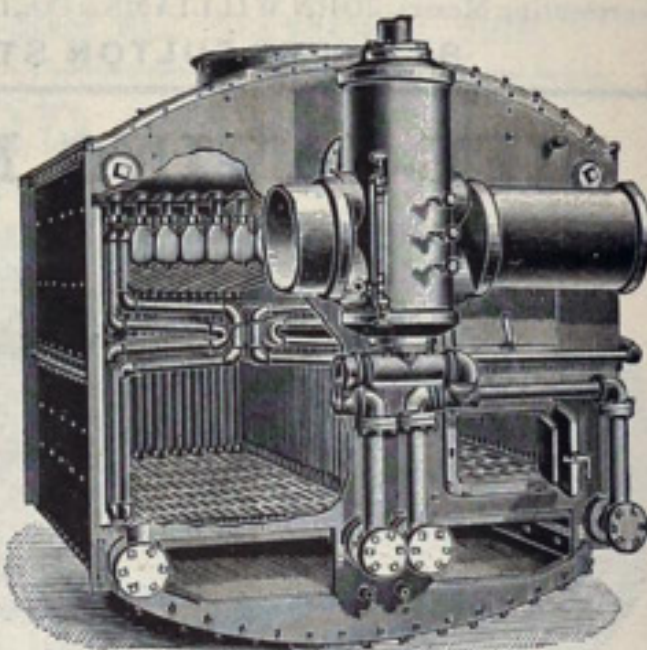
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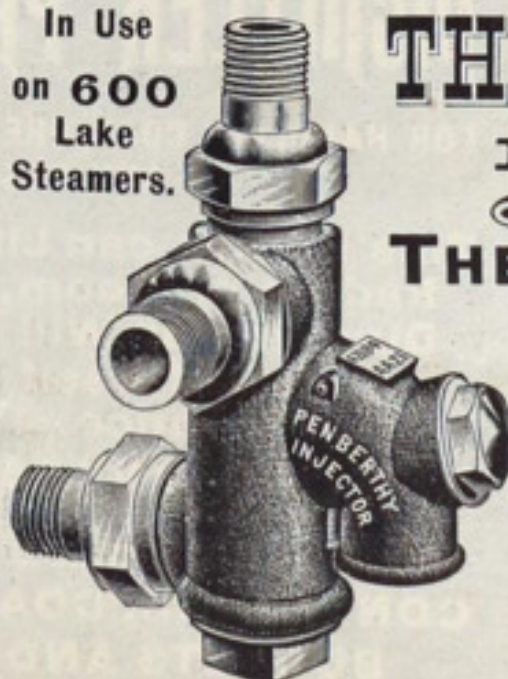
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